

**Final**

**Sycamore Creek Drainage Improvements Project**  
**Biological Resources Assessment Report**  
**Phases 1 and 2**

*Prepared for*

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## **1.0 Introduction**

The City of Santa Barbara (City) proposes to widen a portion of lower Sycamore Creek to help reduce flooding as experienced in 1995. This report describes the proposed project, summarizes existing studies and reports that have been completed for the project area, evaluates the impacts of implementing the project, and provides recommended measures to avoid or minimize those impacts.

## **2.0 Project Description**

### **2.1 Background**

Construction of the existing Highway 101 Bridge over Sycamore Creek, coupled with development upstream along Sycamore Creek has enlarged the 100-year flood plain. This has resulted in flooding north of and including Highway 101, such as in 1995, when after an intense rainstorm, nearly four feet of water flooded the adjacent Sycamore Creek properties (Deluxe and Green Mobile Home Parks).

Caltrans is currently widening Highway 101 from two to four lanes from Milpas Street to Hot Springs Road. In doing so, they are having their contractor replace Sycamore Creek Bridge with a bridge that will have approximately three times the flow capacity of the existing bridge.

The City is cooperating with Caltrans by working on a project to widen lower Sycamore Creek, so it can carry a flow rate that will match, as close as practical, the design capacity of the new Highway 101 Bridge. This would reduce or eliminate the flooding north of and including Highway 101 when the widening is completed.

The City currently has a contract with Penfield & Smith to study Sycamore Creek and recommend cross sections suitable for widening of the creek to carry the desired flow rate. Sycamore Creek is maintained by the Santa Barbara County Flood Control District.

### **2.2 Proposed Project**

The limits of the study area are from 100 feet up stream of the Indio Muerto Street Bridge to 100 feet downstream from the Union Pacific Railroad (UPRR) Bridge (see Figure 1). Most of this portion of Sycamore Creek is approximately 20 feet wide and will have to be widened to approximately 60 feet wide at top of bank. The project will require replacement of the following structures with larger structures: Indio Muerto Street Bridge; Punta Gorda Street Bridge; and UPRR Bridge.

The project would widen Sycamore Creek, in increments over several decades, so it will eventually reduce the area of the 100-year flood plain that now exists upstream from Highway 101. As funding becomes available, the project will be completed in four phases as follows:

1. Widening Sycamore Creek from Highway 101 to 120 feet south of Punta Gorda Street;
2. Widening Sycamore Creek from 120 feet south of Punta Gorda Street to Liberty Street and replacement of the Punta Gorda Street Bridge;
3. Widening of Sycamore Creek from Liberty Street to 100 feet upstream of the Indio Muerto Street Bridge and replacement of the Indio Muerto Street Bridge;

4. Widening of Sycamore Creek from Highway 101 to 100 feet downstream of the UPRR Bridge and replacement of the UPRR Bridge.

The widened creek will have all earthen banks with the bank face being approximately eight feet in height. UngROUTED rock riprap will be placed at the toe of the bank and extend approximately two feet up the bank. No earthen space will be at the top of the bank because the hinge point will be at the property line or at the 60-foot wide point in most places. The new bridges at Punta Gorda and Indio Muerto streets will have earthen bottoms as well and will be sized and designed to eliminate scour on the downstream side that could affect fish passage. Boulder clusters may be placed in the creek bed for fish refuges per the project biologist's recommendation.

Heavy earth-moving equipment will need to work in the creek channel to widen the banks due to lack of work space at the top of the bank in most areas. Work on the creek bottom will be scheduled during the summer to fall low flow period. If water is present in the channel during bank reconstruction, the work space will be temporarily dewatered. Any flow will be diverted past the work space while the banks are restructured. Seepage through the diversion or from subsurface flow will be pumped out of the work area. The diversion structure will be constructed of clean material, such as bags of clean gravel, wrapped in Visqueen and will direct water into a temporary pipe through the work area. Energy dissipation measures will be installed at the downstream end of the pipe to prevent scour of the creek bed. If the creek bed will not support equipment without disturbance of the bed sediments to a depth of less than six inches, clean mats with no leachable chemicals will be used under the equipment. Upon completion of the work, the diversion will be removed from downstream to upstream. For dewatering within the work area, one or more small depressions will be excavated in the bed, and water will be pumped from there. All pumps used for dewatering will have the intake screened with a mesh of 1/8 inch. The water pumped from the bed will be settled and/or filtered to remove visible suspended sediments prior to discharge into the creek downstream of the work area. Energy dissipation measures will be installed at the discharge point. Measures will be followed to reduce impacts to fish as described in Section 7 below.

The City does not have construction funding for this project at this time. The City intends to apply for a Federal Emergency Management Administration (FEMA) Hazard Mitigation Grant to construct Phase 1. The estimate construction cost of Phase 1 is \$500,000.

### 3.0 Summary of Existing Information

Several recent environmental studies cover at least portions of the project area. The following provides a summary of this existing information.

*Draft Natural Environment Study: Santa Barbara State Route 101 Operational Improvements Project, Kiloposts 17.4-20.6 (Post miles 10.8-12.8).* Prepared by Caltrans. August 2002.

The project area in this report covers a two-mile stretch of Highway 101 between the Milpas Interchange and the Hot Springs/Cabrillo Interchange. One aspect of the proposed project is the replacement of the Sycamore Creek Bridge which is discussed here. This report concluded that the Highway 101 project would have no substantial adverse effects on the natural environment. Steelhead trout (*Oncorhynchus mykiss*) and the tidewater goby (*Eucyclogobius newberryi*) are known to occur in Sycamore Creek. Sycamore Creek is critical habitat for the Southern California Evolutionary Significant Unit (ESU) of steelhead. The section of Sycamore Creek at the Highway 101 Bridge is primarily a migration corridor linking the downstream lagoon with higher quality





Figure 1. Project Area



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breeding habitat upstream. A total of approximately 330 square meters would be temporarily impacted by construction of the new Sycamore Creek Bridge, which includes 65 square meters of natural streambed and 265 square meters of concrete lined box culvert channel. This would be replaced with 540 square meters of natural channel bottom with the expanded new bridge. Native vegetation covers about 10-15 percent of the vegetation in the project area and is scattered.

*Mitigation Compliance, Monitoring and Reporting Plan.* Prepared by Caltrans. December 27, 2005.

The plan lists the proposed mitigations, design features, and enhancements identified in the February 2003 version of the FONSI/FEIR. The plan includes: air quality, geology and seismic activity, hazardous waste, hydrology and water quality (pollution prevention Best Management Practices [BMPs], temporary construction BMPs, treatment control BMPs), noise and vibration, biological resources (native tree replacement, migratory bird avoidance, special status species mitigation, and waters and wetlands mitigation), and visual.

The BMPs and other measures applicable to Sycamore Creek are summarized below:

- Standard dust abatement measures recommended by the Caltrans Air Quality Specialist.
- Any hazardous waste that is identified before or encountered during construction will be disposed of properly.
- If groundwater is encountered during construction, the Contractor shall prevent the flow of surface water from entering the excavation. The Contractor shall be prepared to collect, contain, analyze, transport, and dispose of groundwater that may enter the excavation.
- Pollution prevention BMPs including preservation of existing vegetation, concentrated flow conveyance systems, and slope surface protection systems will be incorporated into the project design.
- A Storm Water Pollution Prevention Plan (SWPPP) will be prepared with installation of erosion and sediment control BMPs for protection of water quality during temporary construction.
- Construction site BMPs will be in accordance with the Department guidelines and Regional Water Quality Control Board (RWQCB) requirements. Additional BMPs may also be implemented if determined necessary during construction to reduce or eliminate the potential for a non-storm water discharge to a surface water body, the storm drainage system, or outside of the project limits, to the maximum extent feasible. These will include: Temporary Sediment Control, Temporary Soil Stabilization, Temporary Concentrated Flow Conveyance Systems, Scheduling, Preservation of Existing Vegetation, Clear Water Diversion, Dewatering Operations, Wind Erosion Control, Sediment Tracking Control, Solid Waste Management, Materials Handling, Concrete Waste Management, Vehicle and Equipment Operations, Paving Operations, Stockpile Management, Water Conservation Practices, Illicit Connection/Illegal Discharge Detection and Reporting, Storm Drain Inlet Protection, and Contaminated Soil Management.
- Noise and vibration abatement measures will be incorporated into the design plan.
- All oak and sycamore trees will be replaced.
- To avoid impacts to birds that might use trees in the project area for nesting, all vegetation removal would occur between August 1 and March 15. This would not include the clearing and grubbing of the plant's root systems. Should the Contractor request that removal of trees begin earlier than the August 1 date, surveys to ensure that no nesting birds are in the project vicinity will be conducted by a qualified biologist.

- The conditions outlined in the Biological Opinions from the National Marine Fisheries Service and the United States Fish and Wildlife Service shall be followed. The Project Biologist will be notified at least five (5) working days prior to construction (including any preparation work such as dewatering and water diversion operations) at Sycamore Creek to identify Environmentally Sensitive Habitat protection fencing placement and provide monitoring as per the Biological Opinions.
- Replacement ratios for impacts to waters of the U.S. and wetlands will be 5 to 1 for permanent impacts and 3 to 1 for temporary impacts, or as required in project permits. The approved mitigation locations will be identified in the DFG Streambed Alteration Agreement, Army Corps 404 Permit, and RWQCB 401 Certification.
- Vegetation mitigation shall include detailed landscaping plans and plant lists and that the following items be incorporated into the project design: retain as many existing trees as possible, replace plants that are removed with similar species, add plants along surface streets and easements, add skyline trees, replant with the largest container-size plants feasible, replant shrubs/vines/groundcover, and replant to the maximum extent feasible..

*Summary Table of Impacts at Each Location.* Army Corps of Engineers (ACOE) Jurisdiction. October 2006.

This table lists acres and square meters of temporary and permanent impacts to waters and wetlands under the jurisdiction of the ACOE and California Department of Fish and Game (CDFG) in sections along the project area. Only temporary impacts to waters would occur along Sycamore Creek.

<b>Location along Sycamore Creek (Station)</b>	<b>Temporary Impacts to Waters by Jurisdiction</b>			
	<i>ACOE (Areas below the OHWM) ac/m<sup>2</sup>, m</i>	<i>ACOE (Fill below the OHWM) yd<sup>3</sup>/m<sup>3</sup></i>	<i>CDFG (bank to bank and areas above the plane OHWM) ac/m<sup>2</sup>, m</i>	<i>CDFG (bank to bank and fill above the plane OHWM) yd<sup>3</sup>/m<sup>3</sup></i>
Bridge Work (15+85)	0.027 / 109.3, 49.2	0	0.024/98.6, 48.4	41.2/31.5
Water Diversion (bridge work) (15+85)	0.027 / 109.3, 49.2	29.4/22.5	0	0
Restoration (15+85)	0.054/218.5, 57.0	0	0	0
Water Diversion (51+85)	0.054/218.5, 57.0	37.3/28.5	0	0

*Santa Barbara U.S. Highway 101 Operational Improvement Project Environmental Assessment with Findings of No Significant Impact/Final Environmental Impact Report (FONSI/FEIR).* March 2004. Prepared by Caltrans.

The project area in this report covers a two-mile stretch of Highway 101 between the Milpas Interchange and the Hot Springs/Cabrillo Interchange. One aspect of the proposed project is replacement of the Sycamore Creek Bridge which is discussed here. The report states that coast live oak and western sycamore trees would be affected by the project in the vicinity of Sycamore Creek. Removed trees would be replaced at a 5:1 ratio. Migratory birds may be affected by the project. Vegetation removal would occur between August 1 and March 15 to avoid the nesting season. There would be no impact to the monarch butterfly. Impacts to Southern California steelhead would be less than significant. Sycamore creek does not support a sustainable steelhead run; however, steelhead may use the creek in good rainfall years opportunistically between November 1<sup>st</sup> and April 30<sup>th</sup>. The impact to the tidewater goby was not stated. Temporary and permanent impacts to waters of the U.S. would occur at Sycamore Creek. No wetlands were found at the Sycamore Creek Bridge.

*U.S. Fish and Wildlife Service (USFWS) Biological Opinion.* Appendix K in 2004 FONSI/FEIR.

This biological opinion states that reconstruction of the Highway 101 Sycamore Creek Bridge and the culverts is not likely to jeopardize the continued existence of the tidewater goby. The opinion outlined the nine specific measures provided by Caltrans to reduce the effects of the proposed project on the tidewater goby and included two reasonable and prudent measures to minimize take. These are (1) well-defined operational procedures will be implemented, with the cooperation of an authorized biologist, to avoid or minimize the take of tidewater gobies during project activities, and (2) take of tidewater gobies, through injury or death, found within the proposed project areas will be reduced through the capture and removal of these animals to suitable downstream habitat prior to the proposed action. Terms and Conditions of these reasonable and prudent measures include:

- 1.1 The upstream and downstream limits of project disturbance plus lateral limits of disturbance on either side of the creek must be clearly defined and marked in the field and reviewed by the authorized biologist prior to the initiation of work. The width of areas to be excavated or cleared of vegetation must be minimized wherever feasible. Vehicles and all stockpile storage must remain within well-defined work areas and the staging area.
- 1.2 Equipment use in the creek must be confined to in-channel substrates.
- 1.3 Hazardous materials will be stored at least 30 meters from the stream channel in a designated location with plastic lining for containment of accidental spills. Refueling of vehicles will occur at least 30 meters from stream habitat. All project-related spills of hazardous materials within or adjacent to the construction zone will be cleaned up immediately. Pouring of concrete within the channel will be conducted when the area where concrete is to be deposited is dry.
- 1.4 All vehicles operated within the channel must be maintained daily to avoid leaks.
- 1.5 The work area must be kept clean. All food-related trash items must be enclosed in sealed containers and regularly removed from the project area.
- 1.6 The dams used to divert water into pipes must be removed slowly rather than all at once to reduce the effects of erosion and sediment on tidewater gobies downstream of the project site.
- 2.1 Prior to diverting the creek, removing sediment or vegetation or conducting other work in the channel which could injure or kill individual tidewater gobies, a survey for tidewater gobies will be conducted in the area that will be dewatered as a result of the diversion. All tidewater gobies must be removed from the project area using the following criteria. Blocking nets must be installed 15 meters upstream and downstream of the work area. The area should be seined for tidewater gobies. After creek diversion is completed, the dewatered area will be inspected for stranded tidewater gobies. Any tidewater gobies found will be captured and held for the minimum amount of time necessary to release them in suitable habitat downstream of the project area. If no tidewater gobies are found during pre-construction surveys, blocking nets and seining will not be necessary.
- 2.2 Only qualified personnel authorized under this biological opinion will handle tidewater gobies. The Federal Highway Administration (FHWA) or Caltrans must submit the names and credentials of biologists who will handle tidewater gobies, as described, to the Service for its review and approval, at least 15 days prior to the onset of the activities which they may be authorized to conduct. When an authorized biologist is not present, the resident engineer or designee, after receiving appropriate training by the authorized biologist, may handle tidewater gobies for the sole purpose of removing them from the path of danger.

The USFWS recommended implementing the following conservation actions:



1. Through the conditions of funding, the FHWA should require Caltrans to mitigate for temporal losses to habitat values at the project sites. Some exotic plant species have been noted in the project area. Mitigation could be in the form of removal of these exotic species or enhancement of degraded riparian habitats.
2. The FHWA should ensure the permitted action does not result in the establishment of exotic vegetation in the project area.
3. The FHWA, in conjunction with Caltrans, should conduct annual surveys to assess the status of the tidewater goby population in the Sycamore Creek and Andree Clark Bird Refuge area. Surveys should include searches for additional habitat and populations of tidewater gobies within the project vicinity.
4. The FHWA, in conjunction with Caltrans, should assess the potential for creating additional tidewater goby breeding habitat in the project vicinity.
5. The FHWA, in conjunction with Caltrans, should coordinate with the Andree Clark Bird Refuge resources specialists on issues that affect the tidewater goby in the lagoon.
6. We recommend that any non-native predators of the tidewater goby be permanently removed from the wild if they can be captured while monitoring project activities. We suggest that anyone conducting such removal be in compliance with the California Fish and Game Code.

*National Marine Fisheries Service (NMFS) Biological Opinion. Appendix K in 2004 FONSI/FEIR.*

This biological opinion states that the effects of the Highway 101 project would be disturbance and alteration of aquatic and riparian habitat, disturbance to steelhead, and sedimentation, turbidity and alteration of water quality. Most effects to steelhead would be temporary and the proposed action is not likely to diminish the value of aquatic habitat for steelhead. The project area currently provides migratory habitat for juvenile and adult steelhead. The project will not lead to a reduction in reproduction, numbers, or distribution of steelhead in the action area and the Southern California Evolutionarily Significant Unit (ESU). The opinion includes five reasonable and prudent measures with terms and conditions to minimize and monitor incidental take. These include:

1. Avoid working in flowing water.
2. Employ a biologist for the purposes of monitoring the action area.
3. Implement effective sediment and turbidity control measures.
4. Avoid and minimize impacts to steelhead and habitat from project action.
5. Notify NOAA Fisheries (=NMFS) of the work timetable and prepare a monitoring report.

*Sycamore Creek Tidewater Goby Annual Report –Highway 101 Operation Improvements Project, Milpas Street to Hot Springs Road, Santa Barbara. Prepared by Rincon Consultants, Inc. 2009.*

This report summarizes tidewater goby monitoring during the Caltrans Highway 101 Operation Improvements Project (Phase 1) at Sycamore Creek in 2008. Tidewater gobies are present in Sycamore Creek within the project area and were relocated several times during Phase 1 construction activities.

## 4.0 Methods

SAIC conducted a search of the California Natural Diversity Database (CNDDB) (California Department of Fish and Game [CDFG] 2009b) for special-status wildlife and plant species reported within approximately five miles (8 kilometers) of the project site. The list of wildlife and plant species developed from this search was reduced to include only species that occur in habitat similar to that at the project site.

SAIC biologists, Rosie Thompson and Charis van der Heide, conducted a reconnaissance survey along Sycamore Creek for the proposed project on 28 May 2009. The purpose was to verify that biological and physical conditions of the creek have not changed since the previous reports were prepared and to evaluate the existing habitat along the creek banks that would be removed or disturbed during the proposed channel widening. The extent of Waters of the U.S. was identified, and the channel was qualitatively assessed for the presence of wetlands that could meet the U.S. Army Corps of Engineers jurisdictional criteria. However, no formal wetland delineation was conducted as requested by the City. The biologists noted the presence or potential for sensitive wildlife and plant species.

Photographs were taken at various locations along Sycamore Creek during the survey and are included in Appendix A.

## 5.0 Results and Discussion

The project area follows the Sycamore Creek corridor for approximately 1,330 feet (405 meters), as shown in Figure 1. The creek is bordered by urban and residential development. The banks of the creek are defined by cement flood walls, concrete-filled bags, and pipe and wire revetment in most of the project area. Earthen banks are present in the remaining areas.

### 5.1 Vegetation

The vegetation along Sycamore Creek comprises a mix of non-native, landscape and ornamental vegetation, and native riparian species. Figure 2 shows the habitat types mapped along the project area and Table 1 lists the areas of each habitat type. A list of species observed in the project area is included in Appendix B. A number of highly invasive non-native species are present and include sticky eupatorium (*Ageratina adenophora*), cape ivy (*Delairea odorata*), giant reed (*Arundo donax*), and castor bean (*Ricinus communis*).

The tree canopy is intermittent along the creek. Common native species of the upper canopy included arroyo willow (*Salix lasiolepis*), cottonwood (*Populus balsamifera*), western sycamore (*Platanus racemosa*), and coast live oak (*Quercus agrifolia*) along with a variety of ornamental trees such as eucalyptus (*Eucalyptus* sp.) and palms. The understory on the banks was composed of a diverse assemblage of native species and non-native landscape plants, with the latter dominate in many areas. Vertical walls and banks along the creek were commonly covered with climbing landscape vines.

Native riparian vegetation on the habitat map includes those areas dominated by arroyo willow, cottonwood, and western sycamore trees with open to dense riparian understory. Native upland vegetation includes two areas found to be previously restored with planted natives. These areas include the western bank of Sycamore Creek south of the UPRR and the eastern bank between Punta Gorda Street and Liberty Street.

Vegetation is discussed in more detail below by sections along the Sycamore Creek project area.

**Table 1. Total Areas of Habitat Types along Sycamore Creek**

<i>Habitat Type</i>	<i>Feet<sup>2</sup></i>	<i>Acre</i>	<i>Meters<sup>2</sup></i>	<i>Hectare</i>
Emergent wetland vegetation	2,448	0.06	227	0.02
Patchy wetland vegetation	3,078	0.07	286	0.03
Native Riparian vegetation	7,078	0.16	658	0.07
Native upland vegetation	5,520	0.13	513	0.05
Non-native/ ornamental vegetation	34,851	0.80	3,238	0.32
Developed	32,429	0.74	3,013	0.30

## 5.2 Wetlands and Waters of the U.S.

A formal three-parameter (vegetation, hydrology, soils) wetland delineation under Section 404 of the Clean Water Act was not part of the scope of this report; however, larger patches of obligate wetland vegetation were mapped within the project area as shown on Figures 2 and 3. These areas are dominated by species with obligate wetland indicator status and include ditch beard grass (*Polypogon interruptus*), saltmarsh bulrush (*Scirpus maritimus*), and cattail (*Typha* sp.). All potential wetlands are within the channel, and none are present in areas adjacent to Sycamore Creek. Wetland vegetation types were separated into two categories as listed in Table 1: emergent wetland vegetation and patchy wetland vegetation. Emergent wetland vegetation contained dense, dominate stands of obligate wetland plants that would likely qualify as wetlands in a formal wetland delineation, particularly since wetland hydrology is present. Patchy wetland vegetation included those areas with sparse cover of obligate wetland plants. These areas may develop into dense, dominate stands given time to mature, but would likely not currently qualify as wetlands in a formal wetland delineation. The presence of wetland plants qualifies those areas downstream of Highway 101 as state wetlands under the Coastal Commission criteria (one parameter). The project area upstream of Highway 101 is outside the Coastal Zone.

Waters of U.S. extend approximately from bank to bank and were plotted on an ortho-rectified aerial photo in Figure 3. The width of the channel bottom is approximately 9 to 12 feet (3 to 4 meters) and extends to 20 feet (6 meters) on average at the top of the banks.

During the May 2009 survey, flowing water in Sycamore Creek was approximately 3 to 5 feet (1 to 1.5 meters) wide. With the creek length of 1,330 feet (405 meters) in the project area, the area of open water in the creek is approximately 5,320 square feet (494 square meters).

**Table 2. Area of Waters along Sycamore Creek**

<i>Type of Waters</i>	<i>Feet<sup>2</sup></i>	<i>Acre</i>	<i>Meters<sup>2</sup></i>	<i>Hectare</i>
Waters of U.S. (approx.)	26,842	0.62	2,494	0.25
Open water (approx.)	5,320	0.12	494	0.05

## 5.3 Wildlife

The creek provides habitat for several species of aquatic invertebrates and amphibians. Tadpoles of western toad (*Bufo boreas*) and pacific tree frog (*Pseudacris regilla*) were commonly observed in the slow moving waters and pools. The tidewater goby was observed along Sycamore Creek in several locations. This species is federally listed as endangered, is a state-designated Species of Special Concern (CDFG 2009a), and is discussed further below. Aquatic invertebrates including water striders, water boatmen, and aquatic beetles were observed in Sycamore Creek throughout the project area.

Avian species observed within the project area are common to riparian habitat and areas influenced by human activity. These species include American crow (*Corvus brachyrhynchos*), western scrub jay (*Aphelocoma*





Figure 2. Biologican Resources and Habitat Types along Sycamore Creek



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Figure 3. Wetlands and Waters of the U.S. along Sycamore Creek



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*californica*), dark-eyed junco (*Junco hyemalis*), mourning dove (*Zenaida macroura*), hooded oriole (*Icterus cucullatus*), house finch (*Carpodacus mexicanus*), ash-throated flycatcher (*Myiarchus cinerascens*), oak titmouse (*Baeolophus inornatus*), European starling (*Sturnus vulgaris*), and song sparrow (*Melospiza melodia*).

Cottontail rabbit (*Sylvilagus floridanus*) was observed in the brush south of Highway 101. Raccoon (*Procyon lotor*) tracks were observed in the creek bed along with tracks from domestic dog (*Canis familiaris*) and domestic cat (*Felis catus*). Virginia opossum (*Didelphis virginianus*) and striped skunk (*Mephitis mephitis*) are also expected to be present.

## 5.4 Sensitive Species

Several special status animal species are known or have the potential to occur in the vicinity of the project area along Sycamore Creek. The tidewater goby is known to occur in Sycamore Creek. Additional special status wildlife species that would potentially be present include Southern California ESU steelhead, California red-legged frog (*Rana aurora draytoni*), southwestern pond turtle (*Actinemys marmorata pallid*), and two-striped garter snake (*Thamnophis hammondi*). Other California Department of Fish and Game (CDFG) special status bird species that could potentially occur in the project area during periods of migration include yellow warbler (*Dendroica petechia brewsteri*), yellow-breasted chat (*Icteria virens*), Cooper's hawk (*Accipiter cooperii*), and least Bell's vireo (*Vireo bellii pusillus*). Big free-tailed bat (*Nyctinomops macrotis*) is a CDFG species of special concern and known to occur in Santa Barbara.

Special status plant species known or have the potential to occur in the vicinity of the project area along Sycamore Creek include Santa Barbara morning-glory (*Calystegia sepium* ssp. *binghamiae*) and Santa Barbara honeysuckle (*Lonicera subspicata* var. *subspicata*).

### Tidewater Goby

The tidewater goby was federally listed as endangered on February 4, 1994 (USFWS 1994) and is a state-designated Species of Special Concern (SSC) (CDFG 2009a). Critical habitat was designated for 10 habitats in Orange and San Diego counties on November 20, 2000 (USFWS 2000), and critical habitat was designated at nine locations in Santa Barbara County on January 31, 2008 (USFWS 2008). Sycamore Creek was not included in the critical habitat designation.

Tidewater gobies are small (usually less than 2 inches long) with large pectoral fins and fused pelvic fins that form a sucker-like disk. This is the only goby species along the coast of California that is restricted to low salinity (less than 10 parts per thousand [ppt]) waters. All life stages are completed in these waters (i.e., no marine life history phase occurs), although the fish can live in waters with a salinity of over 40 ppt (Swift et al. 1989, USFWS 2005). This limits the frequency of genetic exchange between populations and lowers the potential for recolonization of a habitat once a population has been lost. Recolonization, however, has been documented to occur at distances up to 20 kilometers from a source population (Lafferty et al. 1996).

Tidewater gobies are benthic (living on the bottom substrate) and feed on small aquatic invertebrates and insect larvae. This species inhabits coastal streams within 2 miles of the ocean and shallow waters (less than 3 feet deep) that are slow moving to still but not stagnant (Irwin and Soltz 1984, USFWS 2005). The coastal lagoons where these fish reside are typically closed off from the ocean by sand bars during summer. The substrate is generally sand and mud with abundant emergent and submerged vegetation (Moyle 1976). In addition to living in coastal lagoons, these fish can also move upstream at least 5 miles as has been documented in San Antonio Creek, Santa Barbara County (Irwin and Soltz 1984).

Spawning in southern California takes place primarily from late April to July, when males dig a vertical burrow approximately 10 to 20 centimeters into clean coarse sand for nesting. The eggs are attached to the walls of the burrow by the female and are guarded by the male until they hatch in 9 to 10 days. Larval gobies are pelagic and found around vegetation for a short time and then become benthic (Swift et al. 1989). The life span of a tidewater goby is generally only 1 year, although individuals in the northern part of their range may live to 3 years (Lee et al. 1980). The short life span makes this species highly sensitive to adverse environmental conditions during the breeding season (USFWS 2005).

The tidewater goby was observed during the survey for this report by SAIC biologists and historically reported in past environmental reports. This species was observed in several locations along Sycamore Creek up to Punta Gorda Street. The bridge (box culvert) at Punta Gorda Street creates a 2-foot (0.6-meter) drop on the downstream side, which possibly limits upstream movement of tidewater gobies during low flows. Punta Gorda Street Bridge may be the upstream limit to the distribution of this species during low flows.

## **Southern California ESU Steelhead**

Southern California ESU steelhead was federally-listed as endangered on October 17, 1997 and is considered a Species of Special Concern by the CDFG (USFWS 1998, CDFG 2009a). Steelhead is known to occur in the limits of the project area and in adjacent drainages (Caltrans 2002). This species prefers clear, cool water with abundant instream cover, well-vegetated stream banks, and relatively stable water flow. The project area provides migratory passage only and no spawning or rearing habitat. A minimum water depth of 7 inches (18 centimeters) and a water velocity of less than 7.9 feet per second (fps) (2.4 meters/second) are required for migrating adult passage (Thompson 1972 as cited in Pauley et al. 1986). However, steelhead adults can swim against higher velocities for short distances if lower velocity resting areas are present.

## **Other Sensitive Species**

The California red-legged frog is federally-listed as threatened and considered a SSC by the CDFG and is known to occur in Cinquefoil Creek, which is approximately 1 mile (1.6 kilometers) east of the project area in Montecito (CDFG 2009b). Adults prefer dense, shrubby or emergent riparian vegetation closely associated with deep (more than 2.3 feet [0.7 meters] in depth), still or slowly moving water. California red-legged frogs will occur in a variety of habitat types, including aquatic, riparian, and upland habitats with permanent water nearby. Well-vegetated terrestrial areas within the riparian corridor may provide important sheltering habitat during winter, foraging areas, and dispersal corridors. The water depth in Sycamore Creek is often too shallow to support breeding, and Sycamore Creek lacks optimal foraging and dispersal habitat. The California red-legged frog has a low potential to occur in the project area because only marginally suitable habitat is present along Sycamore Creek.

The southwestern pond turtle is considered a SSC by the CDFG, has been observed within Sycamore Creek, and is known to occur in adjacent streams and creeks in the vicinity of the project area. This species inhabits ponds, marshes, rivers, streams, and irrigation ditches with muddy or rocky bottoms. No breeding habitat (open sunny areas adjacent to the creek) is present along the project area, and only minimal forage and cover is present. As a result, individuals of this species may occur as transient visitors to the area although the project area supports only marginally suitable habitat along Sycamore Creek.

The two-striped garter snake is considered a SSC by the CDFG and is known to occur in adjacent streams and creeks in the vicinity of the project area. This species can be found near permanent fresh water, often along streams with rocky beds bordered by streamside vegetative growth. Two-striped garter snake has a low potential to occur in the project area because only marginally suitable habitat is present along Sycamore Creek.

The yellow warbler and yellow breasted chat are classified by the CDFG as SSC while nesting. Both species prefer dense, mature willow scrub and riparian forests. The riparian habitat along Sycamore Creek is not dense, and willows that can impede flow are periodically cut or removed. While the yellow warbler and the yellow breasted chat are unlikely to nest in the project area due to lack of suitable habitat, both species may occur in the area as a transient and summer resident (Lehman 1994).

Cooper's hawk is included on the CDFG Watch List while nesting. This species usually nests in woodlands of second-growth conifer stands and deciduous riparian areas and forages near open water and riparian vegetation (Polite and Kiff 1990). This species is a relatively common resident in woodlands along the South Coast of Santa Barbara County and has adapted to the urban environment. Cooper's hawk may forage and nest in the vicinity of the project area.

Least Bell's vireo is federally and California listed as endangered. This species prefers to nest and forage in riparian habitat with a dense understory and structurally diverse canopy dominated by willows and cottonwoods (Kus 2002). Least Bell's vireos generally prefer larger areas of riparian vegetation than those present in the project area. With the close urban environment and regular maintenance of dense, flow restricting riparian vegetation by Flood Control, no suitable habitat is present in the project area for this species. Therefore, least Bell's vireo is not expected to occur along Sycamore Creek.

The undersides of the bridges were inspected for bats or signs of bats during the survey, and none were observed. The big free-tailed bat prefers high cliffs or rocky outcrops for roosting. This species is not expected to occur in the project area due to lack of suitable habitat.

Santa Barbara morning-glory is on the California Native Plant Society (CNPS) List 1A (plants presumed extinct in California), and Santa Barbara honeysuckle is on CNPS List 1B (plants rare, threatened, or endangered in California and elsewhere). These species were not observed during the survey of the project area along Sycamore Creek and are not expected to occur in the project area due to the highly disturbed nature of the native habitat.

## **5.5 Descriptions of Creek Sections (south to north)**

### **South of Railroad**

The section south of the railroad has gently sloping earthen banks and an open canopy of large landscape trees and two small willows (*Salix* sp.) on the east bank and sparsely scattered vegetation in the channel. Vegetation along the west bank is more disturbed in nature and composed mainly of weedy non-natives including Mediterranean mustard (*Hersfeldia incana*), cocklebur (*Xanthium strumarium*), bristly ox tongue (*Picris echioides*), smilo grass (*Piptatherum miliaceum*), white sweetclover (*Melilotus alba*), poison hemlock (*Conium maculatum*), ripgut brome (*Bromus diandrus*), and foxtail (*Hordeum* sp.). The channel has scattered small patches of primarily native vegetation including watercress (*Rorippa nasturtium-aquaticum*), dock (*Rumex* sp.), brass buttons (*Cotula coronopifolia*), iris-leaved rush (*Juncus xiphioides*), and saltmarsh bulrush. A patch of California bulrush (*Scirpus californicus*) is located in the channel downstream of the project area.

A restoration area is present along western bank in this section and includes arroyo willow, California rose (*Rosa californica*), gooseberry (*Ribes* sp.), western sycamore, and red alder (*Alnus rubra*).

### **Highway 101 to Railroad**

The section of the project area between Highway 101 and the railroad tracks is disturbed with gently sloping banks and sparse non-native vegetation on the banks with Italian thistle (*Carduus pycnocephalus*), prickly lettuce (*Lactuca serriola*), milk thistle (*Silybum marianum*), and sow thistle (*Sonchus oleraceus*). Scattered

wetland-associated vegetation occurs in the channel, including watercress, iris-leaved rush, and sedge. A small eucalyptus is located on the western bank and a red willow (*Salix laevigata*) is on the eastern bank.

### **North of Highway 101 to Punta Gorda Street**

The west bank of Sycamore Creek north of Highway 101 to Punta Gorda Street is essentially vertical due to pipe and wire revetment. The east bank also has pipe and wire revetment along the downstream approximately one third and an earthen bank from there to Punta Gorda St. The vertical bank is covered in non-native vines including ivy (*Hedera* sp.), cape ivy, nasturtium (*Tropaeolum majus*), and Himalayan blackberry (*Rubus discolor*). A western sycamore is located on the top of the western bank along with other large ornamental trees. Just north of Highway 101 an area on the eastern edge of the channel is dominated by weedy and wetland-associated vegetation composed of stinging nettle (*Urtica dioica*), annual beard grass (*Polypogon monspeliensis*), watercress, dock, kikuyu grass (*Pennisetum clandestinum*), celery (*Apium graveolens*), and nutsedge (*Cyperus eragrostis*).

The middle portion of this section has a dense overstory canopy of non-native ash tree, landscaped redwood, pitosorum, and California walnut that hang over the channel from the eastern bank. One arroyo willow with two trunks larger than 24 inches (61 centimeters) in diameter overhangs from the western bank.

Upstream of this dense overgrowth, the east bank is dominated by native and non-native vegetation with wetland-associated plants in the channel as indicated on Figure 1. This wetland area contains nutsedge, smartweed (*Polygonum* sp.), young arroyo willows, ditch beard grass, ryegrass (*Lolium perenne*), mugwort (*Artemisia douglasiana*), and mulefat (*Baccharis salicifolia*) along with non-native mint (*Mentha* sp.), smilo grass, fennel (*Foeniculum vulgare*), castor bean, wild radish (*Raphanus sativa*), and kikuyu grass present on the east bank.

The vegetation bordering the Punta Gorda Street Bridge is dominated by landscape and non-native trees and shrubs.

### **Punta Gorda Street to Indio Muerto Street**

The top of the eastern bank of Sycamore Creek from Punta Gorda Street to Liberty Street contains restored native riparian and coastal sage scrub vegetation, with a walking path, that will be removed. The planted species are included in the plant list in Appendix B. The top of the western bank is primarily landscaped ornamental trees and shrubs. The channel adjacent to the restoration area is overhung by several large multi-stemmed arroyo willows with trunks larger than 12 inches (30 centimeters) in diameter (Figure 1). A patch of cattails is located in the channel just north of the Punta Gorda Street Bridge. The understory below the arroyo willows is scattered and composed of ditch beard grass, stinging nettles, horsetail (*Equisetum* sp.), Himalayan blackberry, and kikuyu grass along the edge of the low-flow channel and non-native grasses on the sloping bank. Just upstream of there, several willows growing at the eastern edge of the channel were recently removed (cut near ground level) and the stumps are resprouting. This area also has dense horsetails, fennel, mulefat, ryegrass, decorative sedge (*Cyperus* sp.), common plantain (*Plantago major*), sow thistle, horseweed (*Conyza canadensis*), cocklebur, white sweetclover, yellow sweetclover (*Melilotis* sp.), and Mediterranean mustard.

At the bend in the creek by the west end of Liberty Street, a dense patch of wetland vegetation dominated by cattails fills the channel. The north bank is a concrete wall, while the south bank is primarily covered by dense vines of purple morning glory, Himalayan blackberry, ivy, cape ivy, and nasturtium. A patch of giant reed (*Arundo donax*) was removed from the south bank at the bend in the creek, but it is showing signs of resprouts. Castor bean seedlings are also present. Low sedimentary bars along the channel just upstream of the cattails are colonized by toad rush (*Juncus bufonius*) and arroyo willow seedlings.



From the bend in the creek to Indio Muerto Street, the banks of the creek are defined by concrete walls that are covered with ivy in places and overhung with landscaped ornamental trees. A short segment of the channel has grouted rock at the upstream end of the bend. The earthen channel has scattered kikuyu grass, ditch beard grass, and trash.

Just south of the Indio Muerto Street Bridge is a patch of dense wetland vegetation on a low bar in the earthen channel. This area is dominated by young arroyo willow with horsetail, ryegrass, ditch beard grass, stinging nettle, kikuyu grass, nasturtium, purple phacelia (*Phacelia* sp.), and vetch (*Vicia* sp.).

## **North of Indio Muerto Street**

The section north of Indio Muerto Street is defined by a pipe and wire revetment on the west bank covered with cape ivy and large arroyo willows. The earthen channel is bare of vegetation except a small patch of cattails just upstream of the bridge (Figure 1). The east bank is earthen and slopes gently upwards. It has been landscaped to the edge of the creek with palm trees, ferns, calla lilies, orchids, and a large ornamental pine tree. The bank also has scattered nettles, horsetail, kikuyu grass, nasturtium, cape ivy, smilo grass, and fennel.

# **6.0 Impacts**

## **6.1 Vegetation**

The Sycamore Creek widening project would expand the creek from the existing 20-foot width to an approximate width of 60 feet at the top of bank. The channel widening and construction of the new bridges would remove most, if not all, of the vegetation along Sycamore Creek. The majority of the vegetation is non-native ornamental plants, most of which are invasive species like ivy. Other very invasive non-native species present include giant reed, cape ivy, castor bean, and sticky eupatorium. The removal of this non-native and often invasive vegetation would be beneficial to the creek ecosystem.

Approximately 20 willows would also be removed during the channel widening as would the area of native plant restoration along the east bank between Punta Gorda Street and Liberty Street. This would represent a loss of approximately 0.11 acre (0.04 hectare) of native upland habitat. Included in the area between Punta Gorda Street and Liberty Street are five small coast live oaks, four western sycamores, and at least one cottonwood along with several species of native shrubs which would be removed. A mature western sycamore occurs on the west bank of Sycamore Creek just north of Highway 101. This tree may be removed during construction of the new Highway 101 Sycamore Creek Bridge or the proposed project in Phase 1, or it may be avoided. The native plant restoration on the west bank south of the UPRR is within the project area (Figure 2) but could be avoided during Phase 6 work at the UPRR bridge.

## **6.2 Wetlands and Waters of the U.S.**

Santa Barbara Flood Control regularly clears vegetation from the creek to maintain optimal flows during high rainfall years. Evidence of this maintenance was observed in May 2009 with several willow stumps beginning to resprout between Punta Gorda Street and Liberty Street.

The existing emergent wetland vegetation along the channel has developed between Flood Control maintenance activities, and this growth of vegetation and maintenance would continue to occur after completion of the proposed project. No permanent loss of wetlands would occur as a result of the project, and widening the channel would provide more area for wetland vegetation to establish between maintenance activities.

During construction to widen the channel, the entirety of Waters of the U.S. within each phase would be temporarily disturbed as earth-moving equipment expands and contours the banks and the channel. If flowing water is present during construction, water diversions or dams may be used temporarily to maintain suitable dry working conditions. The bottom elevation of the creek shall remain the same as existing conditions. The completed project would expand Waters of the U.S. in Sycamore Creek from the existing approximate 20-foot width to an approximate width of 60 feet. No permanent loss would occur.

## **6.3 Wildlife**

The removal of vegetation along the banks of Sycamore Creek would result in a loss of habitat for common wildlife species including birds and mammals. Loss of vegetation may affect nesting of birds protected under the Migratory Bird Treaty Act (MBTA) if vegetation removal occurs during the breeding season (February 15 through September 1).

## **6.4 Sensitive Species**

### **Tidewater Goby**

Construction activities would directly affect tidewater gobies and their habitat, particularly downstream of Punta Gorda Street, in phase 1 and Phase 4. Activities at and upstream of Punta Gorda Street (Phases 2 and 3) could directly affect tidewater gobies if any are present in those locations and could indirectly affect this species downstream through altered water flows in the creek and potential releases of sediment or pollutants into the stream. Phases 1 and 4 would involve widening the creek channel in known tidewater goby habitat. As noted in Section 2, the channel would need to be dewatered in the work area so equipment could be operated within the channel. This would require capture and relocation of all tidewater gobies present in the work area by a qualified biologist with all appropriate permits prior to and during dewatering. Injury or mortality of some individuals could result from handling the species, and consultation with the U.S. Fish and Wildlife Service would be required under Section 7 of the Endangered Species Act. Measures to minimize effects on the tidewater goby are described in Section 7 below.

Tidewater gobies have weak swimming abilities and cannot swim against any of the higher water velocities during runoff events, either under current conditions or after implementation of the project. This species uses the boundary layer where the water flows over the bed and along the banks for movement when water velocity exceeds their swimming ability. They also use velocity refuges such as behind rocks or in holes or vegetation along the banks. However, some are swept downstream and even out to the ocean during high discharge events. Providing velocity refuges, particularly downstream of Punta Gorda Street would benefit this species (see Section 7).

### **Southern California ESU Steelhead**

Steelhead would not be affected by construction activities for the proposed project because work would be completed during the dry season when steelhead would not be migrating through the project area. The widened channel would increase its capacity to carry storm runoff, and this would alter water velocity at discharges above the dry season low flows. Water velocity in the project area has been calculated for existing conditions and for the widened channel at discharges of 500, 1,000, 1,400, and 2,000 cubic feet per second (cfs). The results indicate that water velocity during runoff events varies considerably through the project area under current conditions. Peaks in water velocity at all discharges occurred at the UPRR Bridge, just upstream of Highway 101, at Punta Gorda Street, near Liberty Street, and just downstream of Indio Muerto Street. The highest velocities occur near Indio Muerto Street, ranging from approximately 10 to 13 fps. Areas with much lower velocity (approximately 2 to 7 fps) occur between the peak velocity locations.

With implementation of the project, water velocity from the UPRR to approximately 750 feet (229 meters) upstream would generally be lower than under current conditions. Near Liberty Street, water velocity would be increased with the project, but water velocity in the area just upstream of that would remain essentially the same as under existing conditions. The velocity peak just downstream of Indio Muerto Street would be reduced by 0.3 to 1.5 fps for the four discharges. Approximately 100 feet (31 meters) upstream of Indio Muerto Street, peak water velocity would be increased with lower velocities upstream and downstream of that for discharges of 500 to 1,400 cfs. At 2,000 cfs, the peak water velocity would be approximately 12 fps at the road crossing with the project.

In general, the project would decrease peak velocities in the creek during runoff events up to 2,000 cfs, which would improve upstream passage for adult steelhead. The lower velocities (6 to 8 fps) in the downstream portion of the project area would not exceed the swimming speed of steelhead and, thus, would benefit adult steelhead migration into the creek. The higher velocities (9 to 12 fps) near Liberty Street would occur over a short distance and would be unlikely to impede migration since steelhead can swim at those speeds for short times. Adding velocity refuge structures to the bottom, as described in Section 7 below, would aid steelhead upstream migration.

### **Other Sensitive Species**

California red-legged frog and two-striped garter snake have a low potential to occur in the project area along Sycamore Creek. Therefore, impacts to these species are not expected to occur as a result of the proposed project. The southwestern pond turtle has been observed in the area, and individuals could therefore be present as transient visitors, although only marginal habitat occurs in the vicinity of the project. If any of these species are encountered during project construction, the individuals in the work area would be allowed to move out of the area or they would be captured and relocated by the biological monitor, resulting in minimal impacts to these species.

Temporary, but minimal, impacts may occur to yellow warbler, yellow-breasted chat, and Cooper's hawk due to loss of foraging habitat during construction. Because the project would be completed in phases over a number of years, only a small area of habitat would be affected at any one time, and other foraging habitat is present in the region. Because least Bell's vireo and big free-tailed bat are highly unlikely to occur in the project area, no impacts to these species are expected to occur.

No impacts would occur to Santa Barbara morning-glory and Santa Barbara honeysuckle because these species are not present in the project area.

## **6.5 Maintenance Activities**

Maintenance activities for removal of accumulated sediments and colonization by dense aquatic vegetation would continue at intervals, as needed, by the County Flood Control District under their permits for such activities as in the past. Such activities would temporarily affect habitat for aquatic species residing in the creek, including sensitive species such as the tidewater goby. Maintenance activities generally occur during the late summer when flows are low would not adversely affect steelhead migration, but could improve migratory conditions for adults returning in the winter.

## **7.0 Recommended Protection Measures**

The following are recommended measures to avoid or minimize impacts to biological resources during construction activities. These include measures that are part of the project description, applicable measures

from the other studies described in Section 3, and additional measures developed as part of preparing this report.

## **7.1 General**

1. A qualified biologist shall conduct environmental training for all construction personnel prior to their commencing work on the project. This includes all new crews as they arrive to work at the site. The training shall include a description of the tidewater goby, steelhead, and other sensitive environmental resources, habitat where these species are found, protocols to follow when any individuals of sensitive species are found, measures that are part of the project to protect these resources, boundaries of the project, and penalties for violations of the Endangered Species Act and permit conditions.
2. The construction contractor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for each phase of the project. Best Management Practices (BMPs) to reduce erosion, minimize the discharge of sediment, and eliminate the discharge of non-storm water pollutants to the creek shall be included in the SWPPP. All BMPs shall be maintained by the construction contractor in good working order throughout the project duration.
3. The biological monitor shall monitor construction activities, instream habitat, and performance of sediment control/detention devices to identify or reconcile conditions that could adversely affect steelhead, tidewater gobies, or their habitat. The biological monitor shall be present during all construction activities that have the potential to adversely affect environmental resources.
4. Trash and debris from the construction site will be collected daily and disposed in covered dumpsters within the staging area.
5. All conditions in the project permits shall be implemented. This includes the CDFG Streambed Alteration Agreement, Section 401 Water Quality Certification, Section 404 permit from the U.S. Army Corps of Engineers, and biological opinions from the USFWS and NMFS.
6. If sensitive wildlife species are identified within the work area, such as southwestern pond turtle, all construction shall stop and the individual shall be given time to move out of the area. Alternatively, the biological monitor, with the appropriate regulatory authority, may move individuals out of harms way to the closest similar habitat that can be avoided by project activities. If feasible, blocking nets can be set to prevent return of the species to the work area.

## **7.2 Schedule**

7. Work in the creek shall be scheduled for July 1 to November 1 for minimal flow in the creek.
8. Removal of vegetation shall be avoided during the nesting season (February 15 to September 15) to the maximum extent feasible. A qualified biologist shall conduct a nesting bird survey prior to removal of any trees or vegetation schedule to occur from February 15 to September 15. If any nesting is found, the trees/vegetation shall not be removed until after the young have fledged.
9. Work outside the creek channel can occur before July 1 as long as measures to prevent sediment, trash, and debris from entering the creek are implemented.

### **7.3 Water Diversion**

10. Material used to isolate the dewatered area shall be clean and inert materials that will not cause turbidity or release toxic materials to the water. It shall be installed with minimal disturbance of the creek bed and after the area has been cleared of tidewater gobies and any other sensitive aquatic species.
11. All pumped water with visible turbidity (relative to undisturbed water in the creek) shall be settled and/or filtered prior to discharge into the creek downstream of the work area. Energy dissipation shall be used at the discharge of the diversion and the dewatering return to prevent channel bed scour.
12. All pump intakes shall be screened with 1/8-inch mesh that is securely fastened. In addition, screening of the same mesh shall be placed around the intake at a distance where water velocity caused by the pump is below the level that could suck fish against the screen.
13. The biological monitor shall inspect pump intake screens daily when in use to ensure that screens are intact and functioning properly. Any deficient screens shall be repaired or replaced immediately by the contractor.
14. A biological monitor shall be present throughout the dewatering and water diversion operation with the authority to halt work if injury or mortality of listed fish species is observed.
15. Small pits shall be excavated in the creek bed as needed to collect seepage into the dewatered area so it can be pumped out. These pits, and any other ponded water within the dewatered area, shall be inspected by the biological monitor at least daily (at the beginning of construction activities) for the presence of native fish. Any found will be captured and relocated by a qualified biologist.
16. The contractor shall inspect and maintain the dewatering system 7 days a week while in operation.
17. The qualified biologist shall inspect the dewatered area daily to ensure that the diversion remains intact and that no tidewater gobies or other fish have entered the work area. Erosion control measures shall also be inspected.

### **7.4 Tidewater Goby/Steelhead Protection**

18. An initial survey for the tidewater goby shall be completed within one week prior to the start of construction activities in the creek.
19. If tidewater gobies are found, isolate the area to be dewatered using fish block nets (1/8-inch mesh) in flowing water or silt fence in stagnant water.
20. All steelhead, tidewater gobies, and other special status species shall be captured and relocated to suitable downstream habitat. The number of steelhead and tidewater gobies observed, number relocated, and date and time of capture and relocation shall be recorded. Seine, dip net, throw net, minnow trap, and hand can be used to capture the species. Fish captured shall be held in clean buckets with creek water in the shade for the minimum time needed to clear the work area.

### **7.5 Revegetation**

21. Revegetation with native riparian plants shall occur in available space along and at the top of the banks to facilitate soil stabilization and restoration of the riparian corridor along Sycamore Creek.



All oak, sycamore, and cottonwood trees with a diameter at breast height (dbh) of 6 inches (15 centimeters) or more shall be replaced at a ratio of 10:1 surviving after five years while trees smaller than that shall be replaced at a ratio of 5:1. Willows shall be replaced at a ratio of 10:1 or to produce a canopy at least as large as that removed after five years. Oak and sycamore trees will be planted at or within approximately two feet (0.6 meter) of the bank top, depending on location of adjacent structures (including roads). Vines (e.g., blackberry) and herbaceous species will be planted between and below the trees for soil stabilization. Willows will be planted from the top of the riprap to the oaks and sycamores. These will be limbed as they grow to allow flood water passage.

22. A landscape or revegetation plan shall be prepared by a landscape firm or biologist experienced in restoration with native plants. The plan will include use of native species from the Sycamore Creek drainage or nearby areas, a planting plan, installation methods, maintenance requirements, monitoring schedule, performance criteria, and reporting.
23. Pollution Control Concrete shall not be poured in any area that could be exposed to rain or runoff if rain is forecast to occur within 15 days after the pour.
24. Sediment collected in erosion control or sediment detention devices shall be disposed of offsite and will not be allowed to reenter the creek channel.
25. Stockpiled materials, such as excavated soils, shall be stored at least 30 feet from the top of bank and contained with BMPs to prevent wind or water erosion and runoff to the creek.
26. All concrete pours shall be contained so that wet concrete does not come in contact with surface or groundwater. The contractor shall have spill contingency materials on site and personnel trained in their use when concrete is poured. This includes pumps equipment to measure pH in the water to 0.1 unit as well as and water containment (e.g., baker tank or truck) equipment to immediately remove contaminated water during concrete pours, straw bales, Visqueen, gravel bags, absorbent pads, and fiber rolls.
27. Any water within the work area that has or may have come in contact with wet concrete or grout shall be tested for pH. If the pH is greater than 8.5 or more than 0.5 unit above that of the adjacent creek water, pump the water out and treat prior to disposal where it cannot affect surface or groundwater.
28. Concrete trucks shall only be allowed to wash out into a Baker tank in the staging area. The washout material shall be disposed of offsite.
29. Equipment used within the dewatered creek channel shall be inspected daily for leaks by the monitor. If any are found, a drip pan shall be placed under the leak and it shall be repaired immediately by the contractor.
30. If the dewatered creek bed is too soft for equipment/personnel to work in without disturbing sediments to a depth of more than a few inches, the contractor shall use creosote free, clean timber mats (or other inert platform) typically used in wetland construction BMPs.
31. Refueling of construction equipment shall be in an area at least 50 feet from the top of bank that is bermed and has an impermeable surface.
32. Spill containment and cleanup materials (e.g., shovels, absorbent pads, plastic bags) shall be on site, and construction personnel shall be trained in their use.

33. All equipment maintenance and cleaning shall be offsite or within a staging area over an impermeable surface. All residues of such activities shall be disposed of offsite.
34. All fuel, lubricants, paints, and other construction liquids shall be stored in sealed containers within a bermed containment area at least 100 feet from the creek.
35. All debris and other construction materials shall be cleared from Sycamore Creek prior to reintroduction of stream flows to the channel following removal of the diversion dams.

## **7.6 Invasive Species**

36. Remove and bag all cape ivy prior to general clearing and dispose offsite to prevent its spread (can grow from a piece 1 inch [2.5 centimeters] long).
37. Remove and bag all seed heads from castor bean and sticky eupatorium prior to general clearing and dispose offsite.

## **8.0 Summary**

Because Sycamore Creek is bordered by residential land use, landscape ornamental and non-native vegetation is abundant along the banks. However, the creek contains pockets of native vegetation and wetlands, and the creek supports sensitive wildlife species, including the tidewater goby and steelhead. Widening the creek channel, including at three bridges, in four phases would result in temporary disturbance to the aquatic habitats present and a permanent alteration of the channel banks. Widening the channel would reduce, but not eliminate, the area available to support riparian vegetation. Removal of the existing pipe and wire revetments and other hard structures along the banks with a change to a sloping bank would provide more space for native stream bank vegetation. Removal of non-native plant species along the banks and replacement with native species would provide a more natural habitat along the stream corridor. However, the narrow strip of native vegetation immediately adjacent to urban development would provide minimal habitat for native terrestrial wildlife, although an increase in willows, oaks, and sycamores could benefit a number of bird species by providing cover and perches.

A number of measures to avoid and minimize the effects of the project on sensitive species as well as common native species have been identified.

## **9.0 References**

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## **Appendix A**

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Photographs of Sycamore Creek

Photographs were taken on 28 May 2009.

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Scattered wetland vegetation south of Union Pacific Railroad Bridge (UPRR), looking downstream.



At Union Pacific Railroad, looking upstream under UPRR Bridge and Highway 101 Bridge.





Scattered wetland vegetation in the creek bed between UPRR Bridge and Highway 101 Bridge.



Stream corridor north of Highway 101 Bridge, looking upstream. Pipe and wire revetment is visible on the east (right) bank.





Stream channel with wetland vegetation, looking upstream towards Punta Gorda Street Bridge. Left bank has pipe and wire revetement and right bank is earthen.



Mature (left background) and resprouting (left foreground) willows and wetland vegetation, looking downstream from hear Liberty Street.





Native upland vegetation restoration area with path along east bank between Liberty Street and Punta Gorda Street.



Native upland vegetation restoration area with path along east bank between Liberty Street and Punta Gorda Street.





Wetland vegetation in channel (primarily cattails), looking downstream from Liberty Street concrete embankment.



Wetland vegetation (primarily willow seedlings on bar against concrete, looking upstream at Liberty Street concrete embankment. Grouted rock is in channel bed adjacent to concrete bank on left.





Stream channel looking upstream between Liberty Street and Indio Muerto Street.



Wetland vegetation in stream channel (right side), looking upstream towards Indio Muerto Street Bridge.





Stream channel north of Indio Muerto Street Bridge, looking upstream. Vegetation on banks is primarily landscape species. Several large willow trees are present at the top of the left bank.



## Appendix B

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Plant Species List

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### Appendix B. Plant Species List

<i>Common Name</i>	<i>Scientific Name</i>	<i>Native/ Introduced</i>	<i>Wetland Indicator</i>
Sticky eupatorium	<i>Ageratina adenophora</i>	I	
Red alder	<i>Alnus rubra</i>	N	FACW
Scarlet pimpernel	<i>Anagallis arvensis</i>	I	FAC
Celery	<i>Apium graveolens</i>	I	FACW
California sagebrush	<i>Artemisia californica</i>	N	
Mugwort	<i>Artemisia douglasiana</i>	N	FACW
Giant reed	<i>Arundo donax</i>	N	FACW
Saltbush	<i>Atriplex</i> sp.	I	
Mulefat	<i>Baccharis salicifolia</i>	N	FACW
Ripgut brome	<i>Bromus diandrus</i>	I	
Red brome	<i>Bromus madritensis</i>	I	
Italian thistle	<i>Carduus pycnocephalus</i>	I	
Poison hemlock	<i>Conium maculatum</i>	I	FACW
Horseweed	<i>Conyza canadensis</i>		FAC
Brass buttons	<i>Cotula coronopifolia</i>	N	FACW+
Bermuda grass	<i>Cynodon dactylon</i>	I	FAC
Nutsedge (=tall flatsedge)	<i>Cyperus eragrostis</i>	N	FACW
Decorative sedge	<i>Cyperus</i> sp.	N	
Cape ivy	<i>Delairea odorata</i>	I	
California encelia	<i>Encelia californica</i>	N	
Horsetail	<i>Equisetum</i> sp.	N	FAC to OBL
California buckwheat	<i>Eriogonum parvifolium</i>	N	
Eucalyptus	<i>Eucalyptus</i> sp.	I	
Ficus	<i>Ficus</i> sp.	I	
Fennel	<i>Foeniculum vulgare</i>	I	FACU
Pearly everlasting	<i>Gnaphalium</i> (probably <i>palustre</i> )	N	FACW
Coast goldenbush	<i>Hazardia/Isocoma</i> sp.	N	
Ivy	<i>Hedera</i> sp.	I	
Mediterranean mustard	<i>Hershfeldia incana</i>	I	
Foxtail	<i>Hordeum</i> sp.	I	
California walnut	<i>Juglans californica</i>	N	FAC
Toad rush	<i>Juncus bufonius</i>	N	FACW+
Iris-leaved rush	<i>Juncus xiphioides</i>	N	OBL
Prickly lettuce	<i>Lactuca serriola</i>	I	FAC
Ryegrass	<i>Lolium perenne</i>	I	FAC
Bur clover	<i>Medicago polymorpha</i>	I	
White sweetclover	<i>Melilotis alba</i>	I	FACU+
Yellow sweetclover	<i>Melilotis</i> sp.	I	
Mint	<i>Mentha</i> sp.	I	
Tree tobacco	<i>Nicotiana glauca</i>	I	FAC
Kikuyu grass	<i>Pennisetum clandestinum</i>	I	FACU+
Purple phacelia	<i>Phacelia</i> sp.	N	
Bristly oxtongue	<i>Picris echinoides</i>	I	FAC
Smilo grass	<i>Piptatherum miliaceum</i>	I	
Victorian box	<i>Pittosporum undulatum</i>	I	
Common plantain	<i>Plantago major</i>	I	FACW-
Western sycamore	<i>Platanus racemosa</i>	N	FACW
Smartweed	<i>Polygonum</i> sp.	N	
Ditch beard grass	<i>Polypogon interruptus</i>	N	OBL
Annual beard grass	<i>Polypogon monspeliensis</i>	N	FACW+

### Appendix B. Plant Species List

<i>Common Name</i>	<i>Scientific Name</i>	<i>Native/ Introduced</i>	<i>Wetland Indicator</i>
Cottonwood	<i>Populus balsamifera</i>	N	FACW
Coast live oak	<i>Quercus agrifolia</i>	N	
Wild radish	<i>Raphanus sativa</i>	I	
Lemonade berry	<i>Rhus integrifolia</i>	N	
Gooseberry	<i>Ribes</i> spp. (2 species)	N	
Castor bean	<i>Ricinis communis</i>	I	FACU
Watercress	<i>Rorippa nastgurtium-aquaticum</i>	N	OBL
California rose	<i>Rosa californica</i>	N	FAC
Himalayan blackberry	<i>Rubus discolor</i>	I	FACW+
Blackberry	<i>Rubus ursinus</i>	N	FACW
Dock	<i>Rumex</i> sp.		
Red willow	<i>Salix laevigata</i>	N	?
Arroyo willow	<i>Salix lasiolepis</i>	N	FACW
White sage	<i>Salvia apiana</i>	N	
Purple sage	<i>Salvia leucophylla</i>	N	
Black sage	<i>Salvia melifera</i>	N	
Hummingbird sage	<i>Salvia spathacea</i>	N	
Elderberry	<i>Sambucus mexicana</i>	N	FAC
California bulrush	<i>Scirpus californicus</i>	N	OBL
Saltmarsh bulrush	<i>Scirpus maritimus</i>	N	OBL
Redwood	<i>Sequoia sempervirens</i>	I	
Milk thistle	<i>Silybum marianum</i>	I	
Nightshade	<i>Solanum</i> sp.	I	
Greenspot nightshade	<i>Solanum douglasii</i>	N	FAC
Sow thistle	<i>Sonchus oleraceus</i>	I	FAC
Nasturtium	<i>Tropaeolum majus</i>	I	
Cattail	<i>Typha</i> sp.	N	OBL
Stinging nettle	<i>Urtica dioica</i>	N	FACW
Canyon sunflower	<i>Venegasia carpesioides</i>	N	
Vetch	<i>Vicia</i> sp.	I	
Cocklebur	<i>Xanthium strumarium</i>	I	FAC+
Calla lily	<i>Zantedeschia aethiopica</i>	I	OBL
<b>Additional Landscape Plants and Ornamentals</b>			
Palm		I	
Yucca		I	
Ash (non-native)		I	
Fig		I	
Purple morning glory		I	
Banana		I	
Bamboo		I	
Ferns		I	
Grape		I	
Ornamental pine		I	
OBL = Obligate (in wetlands >99%), FACW = Facultative Wetland (in wetlands 67-99%), FAC = Facultative (in wetlands 34-67%), FACU = Facultative Upland (in wetlands 1-33%)			